Region 8

Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming

Springtime Melts Strain Small System Capacities

Saguache WWTP, Colorado

Wastewater treatment plants near mountainous areas often have to deal with the challenges of spring run-off—unusual amounts of water entering the system as a result of melting snow.

This was the problem at the Saguache WWTP, located in the San Luis Valley in the south central mountains of Colorado. Mountains surround the valley, with the Sangre De Cristo Mountains to the east and the La Gartia mountain range to the west. The valley is home to many ranches and farms and a vast wildlife preserve of wetlands. In the spring, many millions of gallons of water stored in the surrounding mountains' snow caps start to flow to the valley bottom. This enormous volume of water raises the ground water level to within five feet of the ground surface in the same timeframe as the seasonal run-off.

In 1996, the Saguache WWTP began working with Mike Daniels, a 104(g)(1) assistance provider from the Red Rocks Community College Environmental Training Center. The WWTP was having compliance problems due to this seasonal run-off and an aging collection system with infiltration problems. The widely varying demands on the facility's system were stressing the facility's capabilities. For instance, in 1998, the peak flow was 167 percent of the facility's design. The average flow is only about 70 percent of design capacity.

Daniels trained the Saguache operator on proper sampling procedures, thus improving the facility's reporting accuracy. Daniels also trained all the facility's maintenance personnel on troubleshooting and repair of the chlorine system, eliminating a short-circuiting problem. Together they located and repaired an underground chlorine leak. In addition, Daniels trained the crew on grounds maintenance and cleaning weeds and algae out of the final settling pond.

After 18 months of training and minor alterations, the Saguache facility dramatically improved its effluent quality. "The operator's dedication to his job with assistance from the maintenance crew has produced a consistently clean effluent—reducing effluent biochemical

oxygen demand by 17 percent, total suspended solids by 56 percent, and fecal coliform levels by 13 percent," Daniels wrote in his description of the project.

Aging Treatment Plant Receives a 104(g)(1) Overhaul

Town of Lavina WWTP, Montana

The Lavina WWTP was built over 40 years ago, with a lift station upgrade in 1967. The facility serves 151 customers and discharges to the Musselshell River. In July 1997, Steve Habener, a 104(g)(1) technical assistance provider, began working with the Lavina facility, which was out of compliance with its effluent permit.

Habener found that the facility had a number of potentially serious weaknesses, including incorrect operation, an inflexible facility design, lack of financial reserves, and no facility operation and maintenance manual. Habener also noted several safety concerns, including lack of necessary safety equipment and an uncovered lift station.

Total suspended solids levels dropped dramatically, from an average of 12.6 pounds per month to 1.8 pounds, preventing more than 105 pounds of pollutants per year from entering the environment.

By addressing these weaknesses in the system, the town of Lavina was able to move back into compliance after less than a year of training and alterations. Biochemical oxygen demand dropped below permit limits. Total suspended solids levels dropped dramatically, from an average of 12.6 pounds per month to 1.8 pounds, preventing more than 105 pounds of pollutants per year from entering the environment.

Problems Plague New Facility

Melrose WWTP, Montana

Melrose, Montana, is situated between Butte and Dillon on the Big Hole River and is famous for its great fishing. Unfortunately, in 1994, this idyllic community of approximately 130 residents was struggling with the operation—and even the existence—of their fairly new wastewater treatment facility, which was built because septic tank failures were contaminating the drinking water supply.

The facility was receiving complaints of "extreme odors." In response, the state was considering requiring the town to upgrade its facility, even though it was only three years old. Within the community there was a remarkable lack of financial and public support for the facility.

Doris Roberts, 104(g)(1) assistance provider with Montana State University (Northern), noted all these difficulties in her assessment of the Melrose facility in the fall of 1994. "The lack of support for the system is, and will continue to, impede decisions that must be made by the Board. Education and public relations are the only way to eliminate this factor," Roberts wrote in her description of the project. Another major problem she noted was that a preventive maintenance schedule was not being followed at the facility. Seals and bearings were wearing out in the dry well pumps. The collection systems were not being flushed, and the generator was not exercised.

In a public advocate role, Roberts spoke at a Sewer Board meeting and educated residents about their facility's problems. "The public realized that they would never get their septic tanks back and that their attitude toward the lagoon facility was resulting in higher costs, and the board agreed to be more responsive to the citizens," Roberts wrote of the meeting.

At this meeting, the town also decided to hire a new operator. Roberts helped the operator set up a preventive maintenance schedule, as well as a system of recordkeeping. As a result of these efforts, the facility's odor problems were eliminated without having to resort to an unnecessary and costly upgrade.

New Operator Learns Basics

Portal WWTP, North Dakota

Operator turnover is a common problem among wastewater treatment plants in small communities. Experienced operators can easily find better pay and advancement opportunities at larger facilities—sometimes leaving the small facilities to totally inexperienced workers. The 104(g)(1) program is an ideal resource in this situation.

Portal, North Dakota, a tiny community of 192 people located on the U.S.–Canadian border, found itself in this bind in the fall of 1998. The Portal WWTP had fallen into disrepair, and, very unexpectedly, the community found itself without an operator. The newly hired wastewater treatment superintendent was basically "thrown to the wolves" with no training or information. He turned to the 104(g)(1) program for assistance to help him learn about wastewater treatment and how to properly run the facility's two-cell stabilization pond system that discharged into a constructed wetland system.

During the 104(g)(1) evaluation and training, both the city and the new operator were very enthusiastic about getting their facility back on track. Subsequent follow-up visits and inspections have shown that the facility has turned the corner and is running very smoothly. Repairs to the facility have been made, operation and maintenance training provided, and the operator has become certified. The operator even established a constructed wetland system into which the discharge flows. The constructed wetland system not only provides excellent treatment for wastewater, but also furnishes the local wildlife with an important natural habitat.

Operator Training Pays Back Big Dividends

Pukwana WWTP, South Dakota

Limited finances and a limited work force make inadequate operator training a common problem for systems serving small communities. This was the main problem discovered by Randolf Hilding, a 104(g)(1) technical assistance provider with South Dakota's Department of Environment and Natural Resources, when he began working with the Pukwana WWTP in 1995.

Hilding discovered that a person with no experience in wastewater treatment had been hired to operate Pukwana's two-cell stabilization pond system. The previous operator had not trained the new employee, and no operations and maintenance manual was available. In addition, Hilding found that no discharges had ever been reported from the facility, even though the pond volume was inadequate for total retention. Infiltration and inflow rates sometimes increased the flow to five times what was normal. The facility's lift station

needed rehabilitation, and the town's wastewater budget had no dedicated capital improvement fund.

Hilding helped to develop an operations plan that could serve as an O&M manual. He trained the operator in sampling and reporting and in using lift station run time to calculate influent flow. Pumps were calibrated and effluent flow measurement options were demonstrated to the operator. Hilding also helped the operator through proper discharge procedures. Since the 104(g)(1) assistance began, the operator has attended training courses and has become certified.

In addition to helping with operator training, Hilding made recommendations to the operator and town council about ways to reduce the system's infiltration and inflow and the need for increasing the wastewater budget. The lift station was rehabilitated, an effluent flow measurement device was installed, and sewer rates were established for a capital improvements fund.

Hilding's help through the 104(g)(1) program cost only about $4,800. The program's assistance saved the town of Pukwana approximately $36,000 in enforcement action.

Tougher Standards Met Through 104(g)(1) Assistance

Town of Baggs WWTP, Wyoming

The Town of Baggs is a rural community located in south central Wyoming. The town has a three-cell aerated lagoon system that eventually discharges to the Little Snake River. The town was having problems with new NPDES ammonia limits when the Wyoming Department of Environmental Quality referred it to the 104(g)(1) program at Casper College in the spring of 1996.

The 104(g)(1) program provided a comprehensive performance evaluation (CPE) which indicated that the lagoon should meet biochemical oxygen demand and total suspended solids requirements. Sludge and dissolved oxygen profiles were also conducted as part of the CPE. After analyzing several years of lab data, Bill Mixer, the 104(g)(1) trainer, realized that the lagoon would not be capable of meeting the winter NPDES ammonia level of 4.7 mg/L. It also appeared that the high winter ammonia levels were causing violations of the NPDES biochemical oxygen demand values, due to nitrification taking place during the BOD test.

Mixer performed calculations regarding the possibility of the town running the lagoon in a draw and fill mode so that there would be no discharge during the winter months. The calculations indicated that the intermittent mode could work. The winter of 1996–97 was the first year for the intermittent discharge program. During this period there was only one violation for ammonia, which occurred in the month of April. This is compared to three or four violations per year for ammonia in years past. There were also no violations for BOD during this period. The operator was able to hold flows during the months of December through March.

During the 1997–98 winter, the intermittent discharge program was from December through April. This time there were no violations of the NPDES permit. This program was implemented with a minimal cost to the town, and it appears that this method of operational control will keep the plant in compliance for the foreseeable future.

Regional Partnerships for Technical Assistance Reap Benefits

Moab WWTP, Utah

Sometimes more than one program or organization is trying to achieve the same goal as 104(g)(1)—cleaner water through more effective wastewater treatment. When these programs can be coordinated, each calling on their specific strengths, everyone wins. This is happening in EPA Region 8, where the states' 104(g)(1) providers work cooperatively with the local Rural Water Associations and other environmental professionals.

"In Region 8 states where good relations exist with Rural Water, facilities are referred by them. In many cases, Rural Water works alongside the trainers to assist the facility," Pauline Afshar, EPA Region 8 Coordinator of the 104(g)(1) Program, wrote in her description of this cooperative relationship. The Montana 104(g)(1) grantee indicates that one-quarter of their work comes from referrals from the Montana Rural Water Association.

For instance, at a project at the Moab Wastewater Treatment Plant, in Utah, a 104(g)(1) technical assistance provider, a Rural Water trainer, and the Moab operator worked together to build baffles in the facility's clarifiers and save money for the small town.

In addition to on-site assistance, this cooperative arrangement in Region 8 extends to other training areas. All Region 8 trainers identify training needs in their areas and then work with other state training organizations to coordinate and participate in presenting needed workshops, according to Afshar. Afshar notes that the 104(g)(1) trainers have also worked with state and other environmental professionals to provide on-site and classroom training on subjects such as advanced treatment and microbiological troubleshooting.

Region 8 Contacts

U.S. Environmental Protection Agency

Pauline Afshar
EPA Region 8 Coordinator
Office of Partnerships and Regulatory Assistance
999 18th Street, Suite 500
Denver, CO 80202-2466
(303) 312-6267
afshar.pauline@epa.gov
http://www.epa.gov/region8

Colorado

Michael F. Daniels
Environmental Training Center
Red Rocks Community College
13300 West 6th Avenue
Lakewood, CO 80228-1255
Phone/Fax: (303) 279-2584
mfdent@rmi.net
http://www.rrcc.cccoes.edu/business/cetc.html

Montana

Doris Roberts
Hagener Science Center
Montana State University - Northern
Havre, MT 59501
(406) 265-3757
Fax: (406) 265-3777
doris@hi-line.net
http://www.msun.edu/stuaffairs/admissions/potentia.htm

North Dakota

Craig Bartholomay
North Dakota Department of Health
Environmental Health Section
1200 Missouri Avenue
P.O. Box 5520
Bismarck, ND 58506-5520
(701) 328-6626
Fax: (701) 328-5200
cbarthol@state.nd.us
http://www.health.state.nd.us/ndhd/environ/mf/train/~otc.htm

South Dakota

Randy Hilding
Akeley Science Center
414 East Clark
Vermillon, SD 57069
(605) 677-6146
Fax: (605) 677-5895
rhilding@usd.edu
http://www.usd.edu

Utah

Paul Krauth
Utah Department of Environmental Quality
Division of Water Quality
288 North 1460 West
Salt Lake City, UT 84114-4870
(801) 538-6146
Fax: (801) 538-6016
pkrauth@deq.state.ut.us
http://www.eq.state.ut.us/eqwq/dwq_home.ssi

Wyoming

William Mixer
Environmental Training and Resource Center
Casper College
125 College Drive
Casper, WY 82601
(307) 268-2670
Fax: (307) 268-2051
wmixer@acad.cc.whecn.edu
http://www.cc.whecn.edu/et.html